

New or Noteworthy Orchids

BY

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IN the following pages twenty-two new species are proposed, and the results of recent studies of tropical orchids are set forth. The new species, with the exception of the West Indian *Pleurothallis archidiaconi*, are natives of Costa Rica.

The sequence of genera conforms to the arrangement adopted by Pfitzer in Engler and Prantl's "Die natürlichen Pflanzenfamilien."

The illustrations have been prepared from dried specimens, with the exception of *Vanilla odorata* Presl, of which the flower was drawn from material sent in alcohol from Ecuador and *Epidendrum caligarium* Reichb. f., the flowers of which were sent in alcohol from Panama.

Unless otherwise specified the type specimens have been deposited in the author's herbarium.

Vanilla odorata Presl Rel. Haenk. 1 (1830) 101; Klotzsch in Bot. Zeit. 4 (1846) 563; Rolfe in Kew Bull. (1895) 178; Rolfe in Journ. Linn. Soc. 32 (1896) 471.

Presl's original description is as follows:

"V. foliis lineari-lanceolatis acutis nervosis, capsulis lineari-lanceolatis longitudine foliorum.

Hab. in Guayaquil.

Scapus teres, repens, foliosus, ad articulationes radicans. Folia brevissime petiolata, erecta, lineari-lanceolata, acutissima, nervosa, carnosa, 5-7 pollices longa, 6-8 lineas lata. Spica brevis, rhachi a floribus delapsis cicatrisata. Flores deperditi.

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Capsula sessilis, lineari-lanceolata, basi et apice attenuata, capitellata, semipedalis vel parum longior. Semina nigra nitida aptera.

A. *V. angustifolia* et *V. planifolia*, quibus affinis videtur, foliis capsulisque differt.

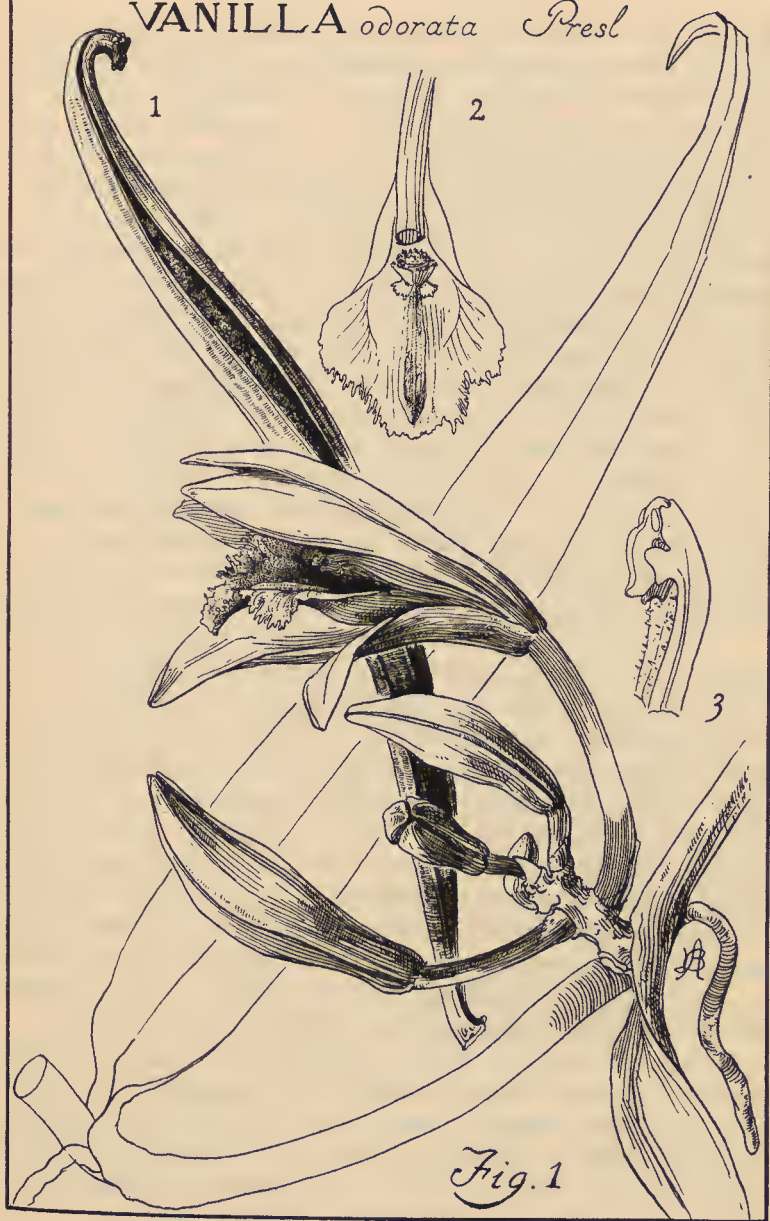
Odorem aromaticum specificum triginta sex post ellapsis annis, quod specimina collecta fuerunt, capsulae nondum perdiderunt."

A straggling, scandent herb with distant, very narrow, alternate leaves and slender stems. Leaves coriaceous, up to 18.5 cm. long, 1.5–2 cm. wide near the base, about 2 mm. thick when fresh, linear-lanceolate, acute, apex sharply deflexed. Lateral sepals somewhat spreading, 5 cm. long, 1.3 cm. wide, lightly concave, fleshy, narrowly lanceolate, subacute. Dorsal sepal 5.2 cm. long, 1.1 cm. wide, narrowly lanceolate. Petals 5 cm. long, 1 cm. wide, narrowly lanceolate, obtuse, lightly earinate along the middle on the outer surface. Labellum 4.5 cm. long, 2.2 cm. wide above the middle, below the middle united with the column to form a tube; expanded portion 2.1 cm. long, flabellate, lightly triearinate along the middle nerves, the keels rounded and near the distal end giving rise to several retrorse papilliform emergences, coarsely fimbriate on the anterior margin, some of the divisions of the fringe shortly bifurcate. Disc ornamented with a large crest beneath the column, the crest being multilamellate, with the lamellae truncate and minutely fimbriate on the upper edge. Column densely glandulose on the anterior surface.

Vanilla odorata Presl was described originally from fruiting material. It has remained among the doubtful species of the genus. R. A. Rolfe, in his monograph of *Vanilla*, was unable to discover a single clue regarding the floral characters of Presl's species, although by means of the foliage he was able to place it in his key, and to differentiate it by folia-characters from its probable allies.

Klotzsch, in 1846, when he published his notes on *Vanilla*, referred to *V. odorata* Presl as follows: "*Vanilla odorata*

VANILLA odorata Presl





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Presl in Reliq. Haenk. p. 101. aus Guayaquil, scheint ebenfalls der Blattform nach eine gute Species zu sein, die der *V. Ruiziana* zunächst kommend, sich durch sehr schmale, 5-8 Linien breite und 5-7 Zoll lange Blätter von dieser wie von allen übrigen Arten der Gattung unterscheidet. Es sind von dieser Art weder Blüthen noch Blüthenstand bekannt."

In July 1923, I received for study, from the Bureau of Plant Industry of the United States Department of Agriculture, a miscellaneous collection of *Vanilla* specimens sent from Ecuador for identification. The flowers were in a wretched state of preservation, but the leaves of one of the specimens agreed closely with Presl's description of *V. odorata*. The fruits of this species were said to be a favorite with the Indians and to be much prized by them as a spice. As a result of efforts to secure flowers in good condition, additional material was sent in alcohol.

There seems to be little doubt that the narrow-leaved species represents the *V. odorata* described by Presl from specimens collected near Guayaquil, and I have supplied the description which appears above.

The region where this species was collected has an elevation of about two thousand feet, and while tropical, is not inordinately hot. Here the vanilla industry is unimportant, but the Indians collect the "beans" and sell them to some extent. The specimens examined came from plants cultivated by Mr. Osear C. Felton on the banks of the Napo River not far from Tena. Mr. Felton grows his vanilla plants in shade, either on trellises or on the trunks of bread-fruit trees. The flowers are more or less ephemeral and have to be artificially pollinated to ensure a crop. For the maturing of the "beans" about six months are required.

To *Vanilla odorata* I refer two collections made in Bolivia by the Mulford Biological Exploration of the Amazon Basin. One of these consists of vegetative parts, the other is represented by fruiting specimens, the capsules being about 16 cm. long, blackish when dry, very aromatic, and slender as in *V. fragrans* (Salisb.) Ames. The leaves are variable in length, sometimes being 20 cm. long and 1-1.3 cm. wide.

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[Fig. 1: 1, mature fruit nearly natural size. 2, labellum with tip of column removed in order to show crest, about natural size. 3, column about natural size.]

ECUADOR, Oriente del Norte, in the district near Tena, Oscar C. Felton, November 9, 1923. (The description was drawn from this material.)

BOLIVIA, Beni, O. E. White 1821, December 3, 1921. Rank growing species in swampy woods. Common. Fruits make good vanilla. 900-1000 feet altitude: Ixiamas, O. E. White 1115, December 13, 1921. Best kind here. Fruits fragrant. Vine common, climbing over small trees in damp forest, often 15-20 feet long. 1000-1500 feet altitude.

Vanilla pompona Schiede in Linnaea 4 (1829) 573; Lindl. Gen. & Sp. Orch. (1840) 437; Klotzsch in Bot. Zeit. 4 (1846) 566; Desv. in Ann. Sci. Nat. ser. 3, 6 (1846) 120; Cogn. in Mart. Fl. Bras. 3, pt. 4 (1893) 147; Rolfe in Kew Bull. (1895) 176; Rolfe in Journ. Linn. Soc. 32 (1896) 465.

Vanilla grandiflora Lindl. Gen. & Sp. Orch. (1840) 435.

Vanilla guianensis Splitg. in Ann. Sci. Nat. ser. 2, 15 (1841) 279 in parte.

Vanilla surinamensis Reichb. f. in Nederl. Kruidk. Arch. 4 (1858) 321 in parte.

Vanilla lutescens Moq. ex Dupuis in Rev. Hort. ser. 4 (1856) 121, fig. 24; Lem. in Fl. des Serres 21 (1875) 115, t. 2218-19.

In addition to *Vanilla odorata* Presl, *V. pompona* is cultivated in Ecuador for its aromatic properties. Although not now an important source of commercial vanilla, its fruits were at one time, under the name of "vanillons," a well-known tropical product, and may have furnished the "vanilloes" referred to by James Petiver in 1693 as an imperfectly known and "most earnestly desired" article of commerce. From information now at hand, it is very probable that *V. pompona* is feral in Ecuador near Guayaquil. Mr. Felton has introduced it on his hacienda near Tena on the banks of the Napo River, having obtained his plants from the natives. The flowers, which last but a day, are large and showy, creamy

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yellow in color, with a delightful fragrance. Under cultivation it is said that the plants will yield two crops a year, six months being required from flower to "bean." Pollination is artificial.

Vanilla pompona differs most conspicuously from *V. fragrans* (Salisb.) Ames in its larger flowers and in the anterior portion of the labellum being devoid of verruciform emergences. The capsules are much stouter and shorter than those of *V. fragrans*, and somewhat trigonous in shape. It is a widely distributed species and has been reported from Mexico, Nicaragua, Panama, Colombia, Venezuela, Bolivia, British Guiana, Dutch Guiana, Trinidad, and is now thought to be a native of Honduras, fruiting specimens having been obtained near Tela by Ames.

Vanilla pompona differs from *V. odorata* Presl in its broader leaves, larger flowers, and shorter, trigonous fruits.

Unfortunately our knowledge of the genus *Vanilla* is still very imperfect. The flowers are ephemeral and very difficult to press, so that the specimens brought in by collectors are usually sterile or so poorly preserved that the floral characters are difficult to interpret. Throughout the literature devoted to the genus, this situation has been emphasized. With the increasing interest now being taken in the vegetation of the American tropics, it is hoped that efforts will be made to preserve flowers of *Vanilla* in alcohol, so that the difficulties of identification of old species and the proper characterization of new ones will be simplified.

ECUADOR, Oriente del Norte, in the district near Tena, Oscar C. Felton, October 14, 1923. "Palanda Vanilla."

***Spiranthes costaricensis* Reichb. f.** in Bonpl. 3 (1855) 214; Reichb. f. Beitr. Orch. Centr. Am. (1866) 46; Reichb. f. Xen. Orch. 2 (1873) 185, t. 179, figs. I, 1-3b.

Beloglottis costaricensis Schltr. Beihefte Bot. Centralbl. 37, Abt. 2 (1920) 365; Schltr. in Fedde Repert. Beihefte 19 (1923) 167.

This species, which was first collected by Oersted near Naranjo, in Costa Rica is represented in Reichenbach's

herbarium by three specimens and a series of clearly suggestive sketches. What I take to be the type consists of a few detached flowers and an outline drawing (apparently made hastily with a pen), which illustrates the habit of the plant. The other specimens are complete plants, but seem to represent collections made at a later date than the type. One of these specimens which is about 15 cm. tall was found in Turialba, March 27, 1857, and the other, without date, is a tall, slender plant (about 30 cm. tall) which was collected by Carl Hoffmann somewhere in Costa Rica.

Spiranthes costaricensis appears to be normally epiphytic in Costa Rica, having been so reported by Brenes, in 1922, and by Standley, in 1924; but in Honduras, where I found the species in 1923, it was growing as a terrestrial in rich humus under trees.

COSTA RICA, Naranjo, *Oersted* (TYPE in Herb. Reichb. f. in Herb. Mus. Palat. Vindob. No. 35087): Turialba, *Wendland* 513, March 27, 1857: Without locality, *Carl Hoffmann*: San Pedro de Ramon, *A. M. Brenes* 230, January 1922. Sur les vieux troncs. 1075 meters altitude: Province of Limón, Vicinity of Guápiles, *Paul C. Standley* 37306, March 12, 13, 1924. 300–500 meters altitude. On tree trunk; flowers white; *Standley* 37136, March 12, 13, 1924. 300–500 meters altitude. On tree trunk; flowers white; *Standley* 37363, March 12, 13, 1924. 300–500 meters altitude. On mossy trunk in wet forest; flowers white.

HONDURAS, Guaimas, *Ames II* 139, March 9, 1923. In humid forest: Rio Pelo, *Ames II* 167, March 8, 1923. 260 feet altitude. In rich humus among rocks near river. Leaves pale green; flowers white.

***Spiranthes Prasophyllum* Reichb. f. Beitr. Orch. Centr. Am. (1866) 65.**

The first time I saw *Spiranthes Prasophyllum* alive, it was clinging to the limb of a large tree, growing with its roots partly imbedded in rotting bark. My second collection of the species was found on a stout liana over fifty feet above the ground. The first impression one gets from a study of

this orchid in its native home is that it is a terrestrial species accidentally epiphytic. It is only after several plants have been found, always epiphytic, in widely separated localities, and it is realized how completely they are adapted to an epiphytic life, that the conclusion is formed that here is a species which may indicate in its modified vegetative parts what changes took place in terrestrial orchids when, as they struggled to reach the light, they became successfully epiphytic. The leaves are fleshy yet pliable and soft to the touch, the epidermis is as if highly varnished, extraordinarily glossy and adapted to withstand desiccation.

Spiranthes Prasophyllum was first found in Guatemala by Wendland, the exact localization being "An Stämmen zwischen der Hacienda de Pantaleon und Sapote in Guatemala." January 20, 1857. In March 1923 I found the species in Honduras near the town of Tela on the Atlantic coast.

Unfortunately the type specimen of *Spiranthes Prasophyllum* is missing from the Reichenbachian Herbarium so that our conception of the species is formed from the original description and by the process of elimination. The nearest ally appears to be *Spiranthes costaricensis* Reichb.f., a species which is also epiphytic. The identity of *S. costaricensis* is quite clear.

HONDURAS, Lancetilla Farm near Tela, banks of a rocky mountain stream on a woody liana, *Ames II 164*, March 11, 1923. Flowers cream color; *Ames II 195*, March 16, 1923, on a hardwood tree, high above ground. 400 feet altitude. Flowers greenish becoming flesh color. Leaves extraordinarily glossy, pale green.

Eurystyles Standleyi *Ames sp. nov.* Herba epiphytica, pusilla, foliis rosulatis. Folia elliptico-lanceolata, acuta, margine minute ciliolato. Pedunculus erectus, rufo-pubescent. Racemus densus, floribus congestis. Bracteae inflorescentiae rhombico-lanceolatae, margine glanduloso-fimbriato. Sepala basi connata, oblonga, lateralibus extus glandulosis. Petala oblanceolata, uninervia. Labellum panduratum, basi sagittato-auriculata, ungue calcari omnino

adnato. Columna in pedem recurvum producta. Rostellum obtusum.

Epiphytic herb up to 7.5 cm. tall to the tip of the densely-flowered raceme. Roots fibrous, coarse, spreading. Leaves 3–4.5 cm. long, up to 1 cm. wide, crowded, rosulate, elliptic-lanceolate, membranaceous, shining, acute, with the margin finely and shortly ciliolate. Scape including the raceme 4–7.5 cm. long, exceeding the leaves, densely clothed with rufous pubescence. Raceme 1.5–3 cm. long, up to 1.5 cm. in diameter, many-flowered, with the flowers ascending, crowded. Bracts of the inflorescence rhombic-lanceolate, 12 mm. long, about 5 mm. wide near the middle, acuminate, acute, margin conspicuously glandular-fimbriate, mid-nerve somewhat prominent on the dorsal surface, conspicuously glandular. Ovary about 6 mm. long, ellipsoidal, smooth, inconspicuously pedicellate. Perianth about 7 mm. long, with the sepals and petals hardly spreading. Lateral sepals coherent with the dorsal sepal for about one half their length, forming an ample tubular base which is shortly decurrent laterally on the ovary and narrowed upward; free portion of the sepals about 4 mm. long, narrowly oblong, the laterals conspicuously glandular along the mid-nerve on the exterior surface, the dorsal smooth. Petals adherent to the dorsal sepal, about 4 mm. long, 1.25 mm. wide above the middle, oblanceolate, rounded at the tip, 1-nerved. Labellum adherent to the lateral sepals, glandular near the tip, free portion about 5 mm. long, with the margins adherent to the column at about the middle, pandurate, obtuse, sagittate at the base near the point of insertion on the lateral sepals with the basal auricles 1 mm. wide and glandular. Column 5 mm. long, produced at base into an upcurved foot. Rostellum obtuse.

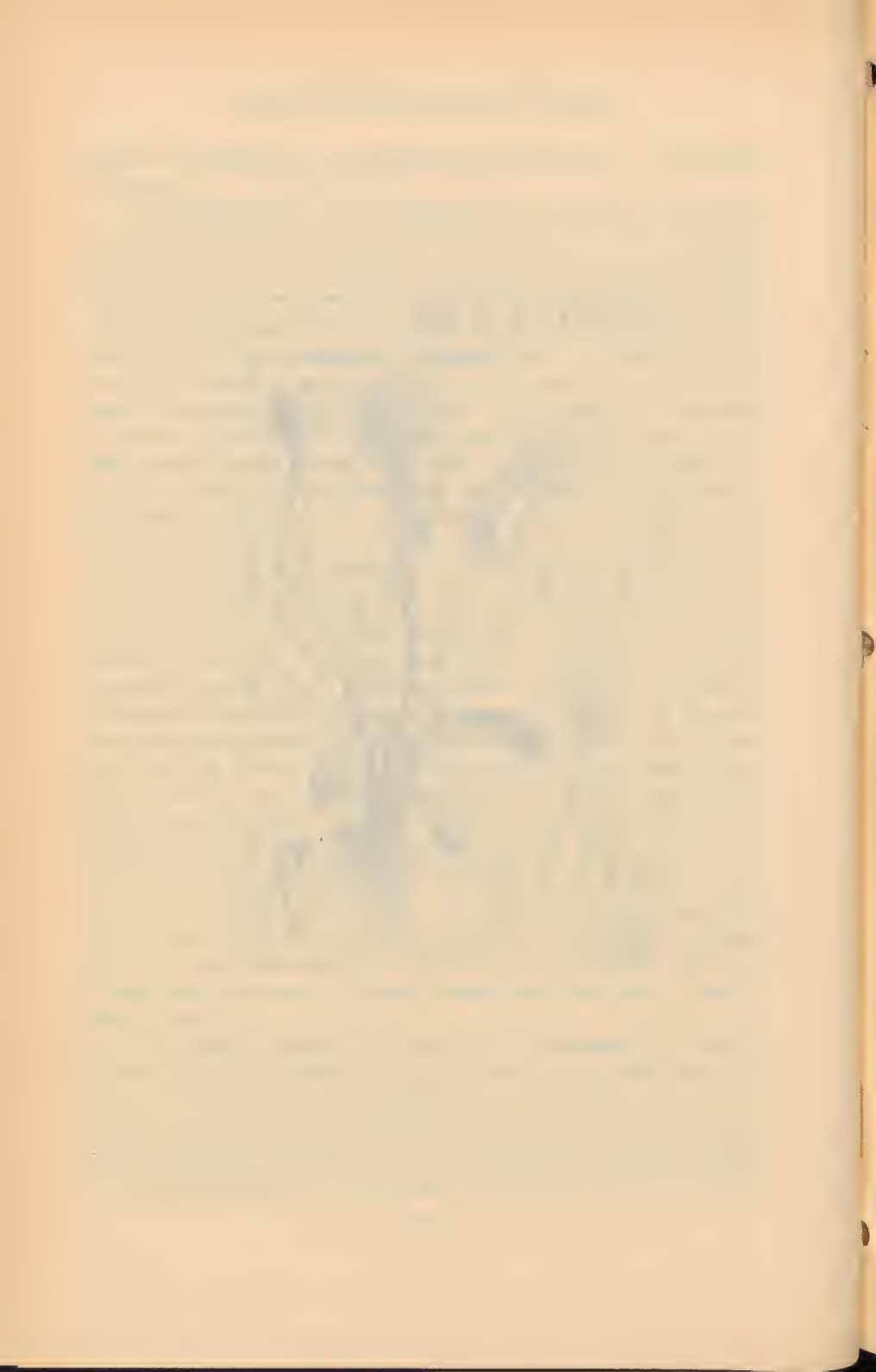
Eurystyles Standleyi is allied to *E. actinosophila* (Rodr.) Schltr., but differs from it in the shape of the petals and labellum. From *E. auriculata* Schltr., the only Costa Rican ally, it differs chiefly in the details of the labellum. [Fig. 2: 1, flower partly dissected to show the perianth organs, column and tubular base of calyx formed by the coherence of the

EURYSTYLES

Standleyi Ames



Fig. 2



lateral sepals with the dorsal sepal $\times 4$. 2, column, pollinia removed $\times 3 \frac{1}{3}$. 3, labellum partly spread out $\times 6$. 4, tip of a floral bract much enlarged. 5, petal $\times 5 \frac{3}{4}$. 6, pollinia much enlarged.]

COSTA RICA, Province of Cartago, El Muñeco, south of Navarro, *Paul C. Standley 33747*, February 8, 9, 1924. About 1400 meters altitude. (TYPE in Herb. Ames No. 29718.): Province of San José, La Hondura, *Standley 36349*, March 2-4, 1924. 1300-1700 meters altitude.

***Stenorrhynchus navarrensis* Ames sp. nov.** Herba terrestris, valida. Folia longe petiolata, membranacea, ovato-elliptica, acuminata. Pedunculus erectus, bracteosus, bracteis arcte adpressis. Racemus multiflorus. Bracteae inflorescentiac flores vix aequantes, usque ad apicem attenuatae. Flores rubri. Sepala lateralia anguste triangularia, extus breviter glandulosa. Sepalum dorsale simile, anguste oblongo-lanceolatum. Petala anguste oblanceolata, usque ad basim valde angustata. Labellum prope medium dilatatum, utrinque angustatum, sparse glandulosum, basi cordata, auriculis obtusis. Discus prope medium glandulosus, nervo medio carinato. Columna elongata, antice glandulosa.

A terrestrial herb about 49 cm. tall to the tip of the inflorescence with about six long petiolate leaves clustered at the base of the erect elongated peduncle. Roots coarse, fleshy, densely white-villose. Leaves green, membranaceous, ascending or erect; lamina up to 12.5 cm. long, 4-7 cm. wide, ovate-elliptic, acuminate, glabrous; petioles more or less imbricating at base, 7-10 cm. long, slender, sulcate. Peduncle (including the raceme) up to 49 cm. long, stout, smooth below, glandular-pubescent above, with several closely appressed bracts at close intervals below the raceme. Bracts 5-9 cm. long, tubular at base. Raceme 11 cm. long, with about fifteen red flowers more or less crowded together. Bracts of the raceme about 3 cm. long, 3-4 mm. wide, tapering gradually to an acute tip, glabrous, equaling or shorter than the flowers, obliquely ascending. Flowers including the

ovary about 3.5 cm. long, with the sepals connivent. Ovary minutely glandulose, about 1.5 cm. long. Lateral sepals 22 mm. long (including the blunt mentum), narrowly triangular, free portion about 3 mm. wide below the middle, acute, distinctly glandulose at base and apex on the exterior surface. Dorsal sepal 21 mm. long, 3.5 mm. wide above the middle, narrowly oblong-lanceolate, acute, strongly concave at the base, lightly adherent to the petals, externally inconspicuously glandulose. Petals about 16 mm. long, 2 mm. wide above the middle, narrowly oblanceolate, tapering to the base, obtuse or subacute, minutely glandulose at the apex. Labellum 18 mm. long, 5 mm. wide near the middle, narrowed toward both ends, 3 mm. wide below the tip, 4 mm. wide near the base, sparsely glandulose on the outer surface, shortly unguiculate, cordate at base with the blunt auricles 1.5 mm. wide, thickened on the outer half. Disc minutely glandulose below the middle. Column about 14 mm. long, characteristic of the genus, densely and conspicuously glandulose on the inner surface.

In dried specimens several transverse folds occur on the lower part of the lip. *Stenorrhynchus navarrensis* is allied to *S. bracteosus* Ames & Schweinf., but is readily distinguishable from it by means of the floral bracts which do not exceed the flowers, by the nearly glabrous ovary, and by the different auricles of the labellum. [Fig. 3: 6, labellum $\times 1 \frac{1}{3}$. 7, flower with one lateral sepal and the labellum removed, slightly over natural size. 8, column and anther nearly twice enlarged.]

COSTA RICA, Province of Cartago, El Muñeco, south of Navarro, *Paul C. Standley* 33957, February 8, 9, 1924. About 1400 meters altitude. Wet bank in forest, leaves green, whole inflorescence red. (TYPE in Herb. Ames No. 29715.)

***Stenorrhynchus Standleyi* Ames sp. nov.** Herba epiphytica, valida, foliosa, foliis ad basim congestis, longe petiolatis. Lamina foliorum elliptica vel ovato-lanceolata, acuminata, acuta. Pedunculus elongatus, validus, bracteatus. Racemus densiflorus. Bracteae inflorescentiae elon-

STENORRHYNCHUS

Standleyi

Ames



Fig 3

S. navarrensis

Ames



gatae, permagnae, flores excedentes. Flores flavi. Sepala lateralalia anguste oblonga, apice cymbiformi. Sepalum dorsale simile. Petala leviter curvata, anguste oblonga, obtusa. Labellum in basi sagittatum, supra basim dilatatum, supra medium contractum, apice obtuso, extus per medium carinatum. Discus prope medium minute glandulosus. Columna generis.

Epiphytic herb, 30–37 cm. tall. Roots fleshy, densely white-villose. Leaves long-petiolate; lamina elliptic-lanceolate or ovate-lanceolate, acuminate, acute, 9–15 cm. long, 3–6 cm. wide, membranaceous, often asymmetrical, erect or recurved; petioles 8–14 cm. long, slender, sulcate, clasping or sheathing at the base, more or less equitant. Peduncle (including the raceme) 28–40 cm. long, glabrous, erect, stout, almost entirely concealed by elongated bracts, bearing at the summit a dense bracteate raceme. Bracts of the peduncle up to 11.5 cm. long, about 1 cm. wide, closely appressed, obtuse or subacute, tubular at the base. Raceme about 6.5 cm. long. Bracts of the raceme about 5 cm. long, 6–12 mm. wide, narrowly oblong-lanceolate, acute, much exceeding the flowers, obliquely ascending, glabrous. Flowers yellow, about 2.5 cm. long, with the perianth segments more or less connivent. Ovary glabrous. Lateral sepals 2.5 cm. long (including the blunt mentum), 5 mm. wide, narrowly oblong-cymbiform and shortly carinate at the tip, glabrous. Dorsal sepal about 2.5 cm. long, narrowly oblong, acute, adhering lightly to the petals, glabrous. Petals about 2 cm. long, 3 mm. wide, obtuse, 1-nerved, narrowly oblong, somewhat curved. Labelum 2.5 cm. long, conspicuously dilated above the sagittate base, then gradually narrowed upward to the obtuse tip, distinctly carinate through the basal half on the outer surface and densely but minutely glandulose; auricles of the sagittate base 1.5 mm. wide, obtuse, conspicuously thickened on the outer half. Disc densely and minutely glandulose below the middle. Column 2 cm. long, conspicuously glandular-hairy on the inner surface.

Among Costa Rican species, *Stenorrhynchus Standleyi* is most closely related to *S. bracteosus* Ames & Schweinf., but

differs from it in having glabrous ovaries, nearly smooth differently colored flowers and different auricles at the base of the labellum. [Fig. 3: 1, base of plant $\frac{1}{2}$ natural size. 2, raceme $\frac{1}{2}$ natural size. 3, flower with perianth segments spread apart to show side view of column and labellum, somewhat enlarged. 4, labellum natural size. 5, column and anther $\times 1 \frac{1}{4}$.]

COSTA RICA, Province of Cartago, Cerro de La Carpintera, *Paul C. Standley 34429*, February 1924. 1500–1850 meters altitude. On mossy tree trunk; leaves green; inflorescence pale yellow throughout. (TYPE in Herb. Ames No. 29737.)

Malaxis boliviana (Schltr.) Ames comb. nov.

Microstylis boliviana Schltr. in Fedde Repert. 10 (1912) 448.

BOLIVIA, Unduavi, *H. H. Rusby 2797*, October 1885. 8000 feet altitude.

Stelis Cooperi Schltr. in Fedde Repert. 3 (1907) 276.

Stelis elliptica Ames & Schweinf. in Ames Sched. Orch. 8 (1925) 16.

Recent collections made in Costa Rica by Paul C. Standley indicate that *Stelis Cooperi* Schltr. is an extremely variable species which includes *S. elliptica* Ames & Schweinf.

COSTA RICA, Province of San José, La Palma, *Paul C. Standley 33215, 38125*, March 17, 1924. About 1600 meters altitude: Province of Cartago, Cerro de La Carpintera, *Standley 34488*, February 1924. 1500–1850 meters altitude: Province of San José, La Hondura, *Standley 36307*, March 2–4, 1924. 1300–1700 meters altitude: Province of Cartago, Alto de La Estrella, *Standley 39114, 39142, 39582, 39586, 39592*, March 26, 27, 1924.

Stelis nubis Ames sp. nov. Caules secundarii cespitosi, vaginati, vaginis laxe adpressis elongatis tubulatis, monophylli. Folia caulibus secundariis breviora, coriacea, anguste elliptica, utrinque attenuata, apice bidentata, nervo

medio producto. Racemus cum pedunculo vix folium aequans, floribus plus minusve secundis. Pedunculus paucivaginat. Bractee racemi oblique infundibuliformes, acutae. Sepala lateralia trinervia, late ovata, subacuta vel obtusa, leviter concava, extus glabra, intus sparse glandulosa. Sepalum dorsale simile. Petala valde carnosae, apice transverse triangulari, glandulosa. Labellum valde carnosum, breviter unguiculatum, triangulare, obtusum, extus minute et dense glandulosum, trans medium valde calloso-incrassatum, callo bilobulato. Columna usque ad apicem dilatata, apice utrinque lobulato.

Epiphytic herb 15-20 cm. tall with spreading, fibrous, whitish roots. Secondary stems densely caespitose, 2-6 cm. long, slender, almost entirely concealed by loosely appressed tubular sheaths, monophyllous. Sheaths up to 3.6 cm. long, dilated upward, truncate or obliquely truncate-acute. Leaf narrowly elliptical, attenuated at both ends, passing into a slender elongated petiole; lamina 3-6 cm. long, 1.5-2.1 cm. wide; petiole about 2.5 cm. long. Inflorescence about 7 cm. long (in the type), sometimes 8 cm. or more long, scarcely equaling the apex of the leaf, partly concealed at base by an elongated tubular bract of the stem. Raceme itself about 4.5 cm. long. Flowers greenish yellow, about 3.5 mm. apart, more or less secund, shortly pedicellate, subtended by hyaloescent infundibuliform bracts. Lateral sepals united almost to the middle, 3 mm. long, 3 mm. wide, broadly ovate from a broad base, obtuse, smooth outside, sparsely glandulose within, 3-nerved, somewhat concave, fleshy. Dorsal sepal 4 mm. long, 4 mm. wide, broadly ovate from a wide base, subacute or obtuse, somewhat thickened at the tip, smooth on the outer surface, sparsely glandulose within, 3-nerved. Petals 1 mm. long, 1.25 mm. wide, .75 mm. thick at the truncate summit, rhomboid, triangular in cross-section at the apex, distinctly and densely glandulose above the middle, equaling the column. Labellum 1 mm. long, 1 mm. wide, triangular in outline in front of the abbreviated claw, about 1 mm. thick, with a transverse thickening across the middle, more or less glandulose outside and inside, blunt at

the apex, 3-nerved. Column about as long as the petals, dilated upward, 3-lobed at the summit; clinandrium entire.

From the closely allied *Stelis Alfredii* Schltr. distinguished in part by the form of the labellum and by the racemes being shorter than the leaves. In the shape of the leaves it resembles closely some of the forms of *S. Cooperi* Schltr., but is a much taller and more robust species.

COSTA RICA, Province of San José, Las Nubes, *Paul C. Standley* 38643 (TYPE in Herb. Ames No. 29331.), 38570, 38595, March 20-22, 1924. 1500-1900 meters altitude.

***Stelis parvula* Lindl.** Fol. Orch. *Stelis* (1858) 7.

Stelis microstigma Reichb. f. Beitr. Orch. Centr. Am. (1866) 94, t. 8, figs. IV, 10-13.

Stelis obscurata Reichb. f. Beitr. Orch. Centr. Am. (1866) 95, t. 8, figs. I, 1 & 2.

Stelis microtis Reichb. f. Beitr. Orch. Centr. Am. (1866) 95, t. 8, figs. III, 6-9.

Stelis Bradei Schltr. in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 385.

Stelis rhodochila Schltr. in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 392.

Stelis parvula Lindl. was described from Nicaraguan material collected by C. Wright in 1853-56. Recently an abundance of material referable to this species has been collected in Central America and is represented in my herbarium by specimens from Costa Rica, Nicaragua, and Guatemala. Critical studies of this material have convinced me that *S. parvula* Lindl. includes *S. microstigma* Reichb. f., *S. obscurata* Reichb. f., *S. microtis* Reichb. f., *S. Bradei* Schltr., and *S. rhodochila* Schltr. The flowers of *S. microtis*, as represented by Wendland's No. 883 from Desengaño, Costa Rica, are similar in every way to flowers of Wright's Nicaraguan plants described by Lindley. From the studies I have made, aided by flowers from the Reichenbachian Herbarium, I am convinced that *S. microstigma* and *S. obscurata* are simply variants of *S. parvula*. *S. rhodochila* Schltr., from sketches of the type accompanied by fragments from Schlechter's type

specimen, would seem to be inseparable from *S. parvula*. *S. Bradei* Schltr. was originally described as a close ally of *S. rhodochila*. From a sketch of the type, and from studies of flowers taken from the type, I have been unable to discover any reliable character for the differentiation of *S. Bradei* from *S. parvula*.

The prevailing color of the flowers of *Stelis parvula* Lindl. is greenish yellow with the labellum sometimes purplish. Rarely the flowers are suffused with purple throughout. These color differences do not seem to be correlated with structural differences and for purposes of classification may be wisely ignored.

NICARAGUA, C. Wright 9, 1853-56: Mombacho Volcano, Maxon, Harvey & Valentine 7795, July 5, 1923. 960 meters altitude.

COSTA RICA, Desengañó, Wendland 883, May 9, 1857: Carpintera, C. H. Lankester 797, April 1924. 5500 feet altitude: Santa Clara de Cartago, Lankester 568, December 23, 1923: Vicinity of La Palma, on road to La Hondura, Maxon & Harvey 8106, July 17, 18, 1923. 1500-1700 meters altitude: Province of Cartago, El Muñeco, south of Navarro, Paul C. Standley 33731, February 8, 9, 1924. 1400 meters altitude: Alto de La Estrella, Standley 39310, March 26, 27, 1924: Province of San José, La Palma, Standley 38001, 38025, 38030, 38046, 38048, 38056, 38059, 38080, 38100, 38111, 38126, 38329, March 17, 1924. About 1600 meters altitude: Las Nubes, Standley 38464, 38490, 38537, 38572, 38596, 38677, 38925, 38929: La Hondura, Standley 36342, 36346, 36381, 36386, March 2-4, 1924.

GUATEMALA, Department of Alta Verapaz, Vicinity of Cobán, road to Chamá, Harry Johnson 320, June 15, 1920. 3000 feet altitude.

***Stelis Standleyi* Ames sp. nov.** Planta *S. Tonduzianam* Schltr. valde revocans. Caules caespitosi, elongati, monophylli. Folium anguste elliptico-lanceolatum. Pedunculus cum racemo multifloro folium valde superans. Bracteeae inflorescentiae hyalescentes, infundibuliformes. Flores atro-

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purpurei. Sepala aequalia, ovata, trinervia. Petala cuneata, prope apicem transverse incrassata, apice retuso. Labellum quadratum, deinde in apicem acutum angustatum. Discus supra medium transverse incrassatus, utrinque obscure lobulatus. Columna generis.

A tall slender plant which closely resembles *Stelis Tonduziana* Schltr. in habit, but is distinguishable from it in having 3- (not 5-) nerved sepals and differently shaped petals. Roots fibrous, whitish, glabrous. Secondary stems crowded, erect, 7-9 cm. long, very slender, wholly concealed by closely appressed nervose sheaths, monophyllous, scarcely 2 mm. in diameter. Sheaths elongated, brownish in dried specimens, becoming gradually dilated upward. Leaf 8-11 cm. long (including the petiole), about 1 cm. wide, narrowly elliptic-lanceolate, tridenticulate at the apex, much exceeded by the raceme; petiole 2.5-3 cm. long, slender, deeply sulcate above. Peduncle 17-20 cm. long, arising near the base of the petiole of the leaf, floriferous almost to the base, sheathed by a lanceolate nervose bract which is about 1 cm. long. Raceme loosely many-flowered, erect, slender. Floral bracts about 2.5 mm. distant between the points of insertion, hyalescent, tinged with purple, infundibuliform or tubular, equaling the flower-stalk. Flowers forty or more, dark purple. Sepals about equal, 3.5 mm. long, 2 mm. wide below the middle, ovate, obtuse or subacute, fleshy, glabrous externally, densely glandulose internally, 3-nerved with the middle nerve prominent on the outer surface. Petals 1 mm. long, 1 mm. wide near the tip, cuneate from a broad base, thickened transversely below the more or less membranaceous shallowly retuse apex, the thickening forming a prominent transverse ridge on the outer surface. Labellum 1 mm. long, about .75 mm. wide, very fleshy, lower two thirds quadrate, the upper third gradually tapering to an acute or subacute tip which is concave on the upper surface; above the middle the disc is heavily transverse-thickened with an obscure erect marginal lobule on each side of the thickening. Column typical of the genus.

Among the Central American species of the genus *Stelis Standleyi* is most closely allied to the Costa Rican *S. Tonduziana* Schltr. Aside from the 3-nerved sepals which constitute a differentiating character, the flowers of *S. Standleyi* are materially smaller than those of *S. Tonduziana*.

The number of nerves in the sepals of *Stelis* flowers has been regarded as a serviceable differentiating character. I have some doubt about this, as recent studies of a large collection of *Stelis parvula* Lindl. have brought to light a specimen in which the nerves of the sepals varied in number from three to five.

COSTA RICA, Province of Cartago, La Estrella, *Paul C. Standley* 39483, March 26, 27, 1924. On tree; flowers dark purple. (TYPE in Herb. Amcs No. 29144.)

***Stelis triangulabia* Ames sp. nov.** Radices elongatae, valde fibratae. Caulis secundarii dense aggregati, caespitiosi. Folium anguste elliptico-lanceolatum, in petiolum elongatum contractum. Pedunculus cum racemo gracilis, folium superans. Sepala usque ad medium connata, trinervia, usque ad apicem sensim rotundata, apice plus minusve acuto. Petala cuneata, supra medium incrassata, carnosa, trinervia. Labellum breviter unguiculatum, supra unguem distincte triangulare. Discus minute glandulosus, prope basim transverse incrassatus. Columna generis.

Roots whitish, smooth, elongated, fibrous, 1 dm. more or less long. Secondary stems densely caespitose, erect, 2-4 cm. long, with several closely appressed tubular sheaths below the middle, monophyllous. Leaf narrowly elliptic-lanceolate, contracted into a slender petiole; lamina 2-3 cm. long, about 4 mm. wide at the middle, tridentate at the apex; petiole up to 12 mm. long. Peduncle with the raceme about 6 cm. long, much exceeding the leaf, arising from the axil of the leaf, sheathed at base by a strongly complanate spathaceous bract. Raceme 3-4 cm. long, slender, about 20-flowered, more or less secund. Bracts of the inflorescence shortly tubular at base, 2-3 mm. long, with the free portion subacute or acute, more or less concave, exceeding the pedi-

cellate ovary. Sepals united to about the middle, 1.5 mm. long, free portion .75 mm. long, 1 mm. wide, rounded gradually to the subacute apex, 3-nerved with the nerves prominent on the outer surface, glabrous. Petals hardly 1 mm. long, .75 mm. wide at the tip, dilated upward, truncate, lightly thickened above the middle, 3-nerved. Labellum .75 mm. long, about 1 mm. wide, shortly unguiculate, triangular in outline above the claw, rounded at the angles, minutely papillose-glandular. Disc slightly concave with a transverse ridge at base in front of the claw, 3-nerved. Column dilated upward.

The flowers appear to have been yellowish and cleistogamous. Closely allied to *Stelis parvula* Lindl., but distinct in the triangular labellum and very different petals and in the bracts of the inflorescence.

Brenes 48 has been referred to *Stelis microtis* Reichb. f. by Dr. Schlechter, but the specimens I have examined are quite distinct from Wendland's material from which Reichenbach described *S. microtis*. (cf. *Stelis parvula* supra.)

COSTA RICA, Los Angeles de San Ramon, A. M. Brenes 48, July 1921. 1050 meters altitude. (TYPE in Herb. Ames No. 28754.)

Scaphosepalum Standleyi Ames *sp. nov.* Herba epiphytica. Rhizoma abbreviatum. Caules secundarii abbreviati, monophylli. Folia anguste elliptica, apice tridenticulata, in petiolum gracilem contracta. Scapus gracilis, paucibracteatus. Racemus gracilis. Flores parvi. Sepala lateralibus usque ad quartam partem apicalem connata, intus bicallosa, extus carinata, carinis demum rostriformibus. Sepalum dorsale oblongum, ad basim concavum, supra medium incrassato-convexum, extus prope basim valde carinatum. Petala semielliptica, apice inconspicue aristato, binervia. Labellum linguiforme, conspicue bicarinatum. Columna apice ampliata.

An epiphytic herb with dark red flowers. Roots fibrous, spreading, whitish, smooth. Rhizome abbreviated. Secondary stems densely caespitose, abbreviated, 5–10 mm. long,



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slender, monophyllous. Leaves erect, narrowly elliptic or elliptic-oblong, tridenticulate at the tip, gradually narrowed downward into a slender sulcate petiole; lamina 5–7 cm. long, 7–10 mm. wide, coriaceous; petiole about 1.5 cm. long. Scape slender, ascending, together with the raceme 5–9 cm. long, with three to four closely appressed tubular bracts. Raceme 2–5 cm. long, slender, the flowers opening in succession. Bracts of the inflorescence about 3 mm. long, obliquely infundibuliform, shorter than the pedicellate ovary. Lateral sepals about 6 mm. long, united almost throughout their length, forming a subelliptical lamina which is strongly concave and is furnished above the middle,— on each mid-nerve,— with a blunt papilliform retrorse emergence; each sepal is strongly earinate exteriorly along the mid-nerve with a keel terminating in a prolonged rostriform appendage. Dorsal sepal 5 mm. long, oblong, obtuse, strongly concave below the middle; apical half thickened, convex, dorsally carinate, with the keel which is nearly 1 mm. deep becoming evanescent above the middle of the sepal. Petals 3 mm. long, about 1.25 mm. wide, semielliptical, 2-nerved, acute, shortly aristate beneath the tip. Labellum 3 mm. long, about 1 mm. wide, linguiform, obtuse, 3-nerved at the base, strongly bicarinate near the middle, the keels more or less crescentiform. Column about 3 mm. long, produced at base into a conspicuous foot, dilated above, tridentate at the tip with the apical margin obscurely denticulate.

In habit and floral structure, *Scaphosepalum Standleyi* resembles *S. Pittieri* Schltr., but differs from it in the lateral sepals with differently situated papilliform emergences, and in the differently shaped aristate petals. [Fig. 4: 1, flower with the perianth segments spread out, showing the external rostrate appendages of the lateral sepals and the retrorse appendages on the inner surface $\times 4$. 2, column $\times 7$. 3, labellum $\times 6 \frac{1}{2}$. 4, petal $\times 6 \frac{2}{3}$.]

COSTA RICA, Province of Cartago, Cerro de La Carpintera, Paul C. Standley 34477, February 1924. 1500–1850 meters altitude. On tree; flowers dark red. (TYPE in Herb. Ames No. 29631.)

Pleurothallis Aguilarii Ames *sp. nov.* Herba epiphytica, nana. Caules secundarii abbreviati, monophylli. Folium cum petiolo oblanceolatum, coriaceum, rigidum. Pedunculus folium superans, pauciflorus. Flores atropurpurei ut videtur. Sepala lateralia cohaerentia, laminam oblongam glandulosam formantia. Sepalum dorsale anguste lanceolatum, glandulosum. Petala valde abbreviata, glabra, ovata. Labellum trilobatum, bicarinatum; lobis lateralibus falcatis, porrectis, pro parte glandulosis; lobo medio orbiculari. Columna in pedem producta, androclinio breviter fimbriato.

Plant epiphytic, the whitish glabrous roots spreading through a mixture of mosses and lichens. Secondary stems caespitose, abbreviated, monophyllous, rarely attaining 1 cm. in length, sheathed when young, the sheaths soon withering and breaking up into fibers. Leaf with the petiole up to 2.8 cm. long, 8.5 mm. wide, oblanceolate, marginate, very coriaceous, rigid, somewhat notched at the tip with the mid-nerve slightly extended. Peduncle exceeding the leaf, paucibracteate below the inflorescence; the bracts about 3 mm. long, tubular, scarious, closely appressed. Raceme slightly exceeding 1 cm. in length, several-flowered. Flowers apparently opening in succession, only one in perfection at a time. Perianth deep purple in the dried specimen examined. Ovary glabrous, exceeding the tubular abbreviated hyalescent bract which subtends the pedicel. Lateral sepals 1.2 cm. long, coherent through nearly the entire length of their inner margin, forming an oblong lamina (4 mm. wide), which is bifurcate at tip; outer half of each sepal conspicuously glandular-hairy; inner half densely and shortly glandulose, but not hairy. Dorsal sepal fleshy, 1.2 cm. long, about 2.5 mm. wide, narrowly lanceolate; on the inner surface, from the margins almost to the center, ornamented with long purplish glandular hairs. Petals 2.5 mm. long, about 1.5 mm. wide at the middle, ovate, obtuse or subacute, membranaceous. Labellum 4.75 mm. long, fleshy, conspicuously and unequally 3-lobed in front of the abbreviated oblong

claw; lateral lobes about 2 mm. long, falcate, with the sub-acute tip directed forward, minutely glandular below the middle; middle lobe 3.25 mm. long (including the isthmus), 1.5 mm. wide, orbicular. Disc conspicuously bicarinate, the keels arising from a fleshy basal callus which is situated in front of the claw. Column 4.5 mm. long, produced into a distinct foot, summit irregularly and shortly fringed or toothed.

Pleurothallis Aguilarii is a member of the perplexing group to which *P. canae* Ames, *P. vinacea* Ames, and *P. Wagneri* Schltr. belong. From *P. bifalcis* Schltr., it differs in the much smaller vegetative structures and in the form of the labellum. From *P. Wagneri* Schltr., it is clearly separable by the glandular-hairy sepals.

COSTA RICA, Volcán de Barba, *Ramiro Aguilar* (No. 33157 of Paul C. Standley's Costa Rican plants), February 3, 1924. (TYPE in Herb. Ames No. 29146.)

***Pleurothallis archidiaconi* Ames sp. nov.** Herba caespitosa. Caules secundarii elongati, graciles, monophylli. Folium coriaceum, ovato-lanceolatum, basi cordato, apice breviter bifurcato. Pedunculi fasciculati, folio breviores. Sepala lateralia cohaerentia, laminam rotundatam formantia, valde concava. Sepalum dorsale cucullatum, anguste ellipticum. Petala oblonga, deflexa, uninervia, margine plus minusve glanduloso. Labellum breviter unguiculatum, ovatum, carnosum, dense glandulosum, leviter unicallosum ante unguem. Columna abbreviata.

Secondary stems elongated, caespitose, 5–17 cm. long, paucivaginate, monophyllous. Sheaths tubular, closely appressed, smoothish. Leaf up to 8.5 cm. long, 1.7–2.5 cm. wide, ovate-lanceolate from a cordate base, acuminate, bifurcate at the apex. Peduncles fasciculate, about 1 cm. long, subtended by a complanate abbreviated spathaceous sheath. Lateral sepals completely coherent, forming an orbicular lamina which is 4 mm. long and 3 mm. wide, 4-nerved, strongly concave. Petals strongly deflexed, 5 mm. long, about 1 mm. wide, oblong, acute, glandular on the margin,

more or less fleshy, 1-nerved. Labellum shortly clawed, 4 mm. long, 3 mm. wide, resting in the concave depression formed by the lateral sepals; lamina very fleshy, ovate from a broad base, obtuse, densely glandulose on the outer surface, concave below the middle with an inconspicuous conical thickening in front of the claw. Column abbreviated, fleshy, about 1 mm. long, apparently entire at the summit.

Allies of this species are *Pleurothallis Cardium* Reiehb. f., which has much larger flowers; *P. Smithii* Schltr., from which it is distinct in its differently proportioned flowers; and *P. tridentata* Klotzsch, which is a smaller plant with different perianth segments. In vegetative structure it suggests *P. pansamalae* Schltr.

TRINIDAD, B. W. I., Verdant Valley, *Archdeacon Arthur Hombersley*, December 11, 1924. Growing on caecao tree. Lip and two (inner) petals red; sepals yellowish green, stained chocolate-brown. Leaf stiff. Upper sepal hooded, with three brownish purple lines; lower sepals forming a rounded lamina. (TYPE in Herb. Royal Botanic Gardens, Trinidad and Tobago No. 10910, and alcoholic specimen from the type plant in Herb. Ames No. 29107.)

***Pleurothallis casualis* Ames sp. nov.** Herba epiphytica, dense caespitosa. Caulis secundarii valde abbreviati, vaginati, monophylli. Folium eum petiolo oblanceolatum, apice tridentatum, marginatum. Pedunculus eum racemo folium aequans. Flores atrosanguinei, perpauci, inter se distantes. Sepala lateralia cohaerentia, laminam ellipticam sexnerviam formantia. Sepalum dorsale anguste lanceolatum, trinervium. Petala ovato-lanceolata, in caudam glandulosam producta. Labellum trilobatum; lobis laterilibus erectis, rotundatis; lobo medio oblongo, obtuso. Discus glaber, earinis duabus ornatus. Columna in pedem brevem producta, apice quadridentata, dentibus denticulatis.

Epiphytic, densely caespitose plant up to 2.5 cm. tall. Secondary stems much abbreviated, less than 5 mm. long, concealed by scarious loosely appressed tubular sheaths, monophyllous. Leaf about 2 cm. long (including the slender



PLEUROTHALLIS *navarrensis* Ames



P. casualis Ames

petiole), scarcely 5 mm. wide, oblanceolate, marginate, bidenticulate at the rounded apex with the middle nerve forming a prominent cusp. Peduncle 2–2.5 cm. long, hardly equaling the leaf, filiform, bearing a few-flowered raceme. Flowers 4–5 mm. apart, two to three in a loose raceme. Bracts of the inflorescence minute, scarious, infundibuliform. Lateral sepals 5 mm. long, united almost to the tip, forming an elliptical plate which is 3 mm. wide; each sepal 3-nerved with the innermost nerve almost obsolete, the middle nerve prominent on the outer surface. Dorsal sepal 5 mm. long, narrowly lanceolate, acute, 3-nerved. Petals about 4 mm. long, 1.5 mm. wide below the middle, ovate-lanceolate, acuminate, membranaceous, 1-nerved, the apical third more or less caudate and densely glandulose. Labellum 2.5 mm. long, lightly 3-lobed; lateral lobes basal, erect, forming together (when spread out) an orbicular plate in front of the terminal or middle lobe which is 1.5 mm. long, oblong, obtuse in outline, and lightly convex. Disc eglandulose or sparsely glandulose, traversed by two longitudinal keels which issue from a minute basal callus. Column more or less arcuate, produced into a short foot, quadridentate at the summit, the teeth inconspicuously denticulate.

A near ally of this species is *Pleurothallis abjecta* Ames, from which it differs in the caudate petals and different labellum. [Fig. 5: 1, flower spread out $\times$ about 3. 2, labellum $\times$ about 10. 3, column flattened out to show the terminal lobes, much enlarged.]

COSTA RICA, Province of San José, La Hondura, *Paul C. Standley* 36517, March 2–4, 1924. 1300–1700 meters altitude. On tree; flowers dark red. (TYPE in Herb. Ames No. 29145.)

Pleurothallis cedralensis Ames Sched. Orch. 4 (May 1923) 18; 7 (1924) 26, t. 6.

Pleurothallis myrtillus Schltr. in Fedde Repert. Beihefte 19 (November 1923) 108.

From the description of the type and from studies of a duplicate of the Brenes collection referred by Dr. Schlechter

to *Pleurothallis myrtillus*, it is clear that *P. myrtillus* is conspecific with *P. cedralensis* Ames and should be reduced to synonymy.

COSTA RICA, près de San Ramon, A. M. Brenes 23, November 1921. 1025 meters altitude: Province of San José, La Hondura, Paul C. Standley 36376, 36402, 36445, March 2-4, 1924. 1300-1700 meters altitude; Standley 37620, 37648, March 16, 1924.

***Pleurothallis costaricensis* Rolfe** in Kew Bull. (1917) 80; Ames Sched. Orch. 7 (1924) 26, t. 14.

Pleurothallis ehrhartiiflora Schltr. in Fedde Repert. Beihefte 19 (1923) 187.

Dr. Schlechter compared his *P. ehrhartiiflora* with *P. glumacea* Lindl. and with *P. tricarinata* Poepp. & Endl. Studies of duplicate material of the type of *P. ehrhartiiflora* have convinced me that this species is inseparable from *P. costaricensis*.

COSTA RICA, San Pedro de San Ramon, A. M. Brenes 141, September 1921. 950 meters altitude.

***Pleurothallis navarrensis* Ames sp. nov.** Rhizoma repens. Caules secundarii valde abbreviati, vaginati, vaginis hispidulis. Folium ellipticum, marginatum. Pedunculi valde abbreviati. Sepala lateralia paene usque ad basim libera, mentum formantia, glanduloso-ciliata, ovato-oblonga. Sepalum dorsale simile. Petala anguste lanceolata, uninervia, margine ciliato. Labellum linguiforme, bene glandulosum, utrinque prope unguem lobulatum. Callus in disco prope unguem conformis. Columna in pedem producta, clinandrio fimbriato.

Rhizome creeping, giving off coarse, whitish roots. Secondary stems much abbreviated, monophyllous, more or less decumbent, about 5 mm. long, concealed by infundibuliform rufous sheaths which become dilated and marginate above with hispidulous emergences on the nerves. Leaf elliptical or suborbicular, obscurely marginate, very coriaceous, conspicuously and deeply rugose when dry, purplish

beneath; lamina up to 12 mm. long, 5.5–6.5 mm. wide, much exceeding the inflorescence. Peduncles fasciculate, abbreviated, about 4 mm. long, partly concealed by sheaths, 1-flowered. Flowers dark red-purple. Lateral sepals free almost to the base, forming a distinct mentum with the blunt foot of the column, 3.25 mm. long, about 1 mm. wide, ovate-oblong, subacute, thickened near the tip, conspicuously 3-nerved, glandular-ciliate on the margin and sparsely glandulose on the inner surface. Dorsal sepal 3.25 mm. long, 1.75 mm. wide, ovate from a broad base. Petals 2.25 mm. long, narrowly lanceolate, 1-nerved, margin distinctly glandular-ciliate. Labellum 2.5 mm. long, about .5 mm. wide, densely glandulose on the upper surface, narrowly linguiform; margin of the upper half deflexed, glandulose-ciliolate; margin of the basal half more or less erect, conspicuously glandular-ciliolate. Claw abbreviated, equaled (on each side) by an auriculiform introrse lobule formed by the base of the expanded portion of the labellum; in front of the claw there is a conical, glandulose, callus-like thickening which is evanescent into rather inconspicuous ridges which wholly disappear near the middle of the lamina. Column 2 mm. long, produced into a blunt-tipped foot, dilated upward, with the clinandrium 5-toothed, the teeth ragged-fringed.

Allied with *Pleurothallis abjecta* Ames, from which it is clearly separable by its abbreviated peduncle and very different petals. [*Fig. 5: 1*, column flattened out to show the terminal lobes $\times 11$. *2*, labellum $\times$ about 10. *3*, petal $\times 9 \frac{1}{2}$. *4*, flower with the perianth segments spread out $\times 6$.]

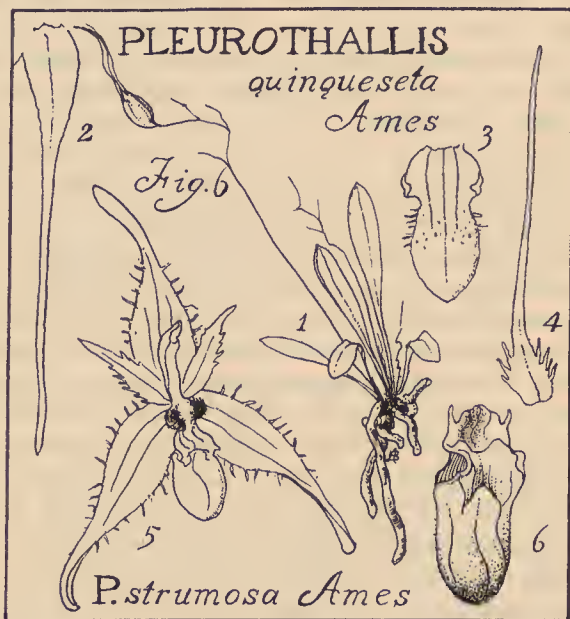
COSTA RICA, Province of Cartago, El Muñeco, south of Navarro, *Paul C. Standley* 33888, February 8, 9, 1924. About 1400 meters altitude. On tree; creeping; leaves purple-bronze, especially beneath; flowers dark red-purple. (TYPE in Herb. Ames No. 29163.); *Standley* 33865, from the same locality as the type, appears to be the same species.

***Pleurothallis quinqueseta* Ames sp. nov.** Herba nana, caespitosa. Inflorescentia laxiflora, folium excedens. Sepala petalaeque in caudas perlongas producta. Petala in margine

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sparse fimbriata. Labellum obscure trilobatum; lobo medio obovato, glanduloso; lobis lateralibus minutis, obtusis, erectis, prope basim disci. Columna (?)

Plant densely caespitose from glabrous whitish spreading roots, excluding the inflorescence 2.5–3.5 cm. tall. Secondary stems very much abbreviated, inconspicuous, mono-



phyllous. Leaves coriaceous, about 2 cm. long, 2–2.5 mm. wide, narrowly oblanceolate, narrowed into a slender petiole, conspicuously marginate, bidenticulate at the apex with the mid-nerve produced into a short cusp. Peduncles filiform, with the dichotomously branched inflorescence 4–6 cm. long, much exceeding the leaves. Branches of the inflorescence 4–5 mm. long, subtended by minute hyalescent infundibuliform sheaths. Lateral sepals almost free, 9–12 mm. long (including the slender elongated caudate termination), ex-

panded portion scarcely 4 mm. long, 1.5 mm. wide, oblong-lanceolate, 1-nerved, the nerve prominent and subcarinate on the outer surface. Dorsal sepal similar to the laterals and equal to them, strongly concave. Petals long-caudate, about 1 cm. long (including the caudate termination), expanded portion 2 mm. long, about 1 mm. wide, with about five unequal fringe-like teeth on each side above the middle, conspicuously 1-nerved. Labellum 2.2-2.5 mm. long, bilobulate near the base, with the lobules erect and rounded at the tip; upper two thirds of the lamina obovate, obtuse, with the margin glandular-ciliate, and the surface distinctly glandulose. Column too mature for studies of the structural details.

Pleurothallis quinqueseta is closely allied to *P. divexa* Ames, from which it differs most conspicuously in the upper sepal being 1-nerved, in the petals being prolonged into caudate tips, and in having a more membranaceous labellum. From *P. setigera* Lindl., a Peruvian species, which is another close ally, it differs in the structure of the labellum and apparently in having the caudate portion of each sepal longer in proportion to the expanded portion.

The name *quinqueseta* is an allusion to the five tails of the perianth. [Fig. 6: 1, general habit about natural size. 2, lateral sepal $\times 4 \frac{1}{2}$. 3, labellum spread out $\times 8$.]

COSTA RICA, Province of San José, La Hondura, Paul C. Standley 36283, March 2-4, 1924. 1300-1700 meters altitude. On tree. (TYPE in Herb. Ames No. 29165.): Standley 38368, from the same locality, appears to be the same species.

***Pleurothallis Standleyi* Ames sp. nov.** Herba epiphytica, caespitosa. Caules secundarii monophylli, nervis muricato-hispidulis. Folium ellipticum, marginatum. Pedunculi fasciculati, ex axilla folii orientes. Racemus pauciflorus. Ovarium glabrum. Flores extus glabri. Sepala lateralia usque ad medium cohaerentia, triangularia, margine minute ciliolato. Sepalum dorsale oblongo-lanceolatum. Petala oblongo-lanceolata, prope apicem lacerato-fimbrillata, uninnervia. Labellum oblongum, margine breviter ciliolato,

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basi cordata auriculis obtusis incurvis. Columna apice lacerato-dentato.

Roots whitish, glabrous. Secondary stems caespitose, more or less erect, 6 cm. long when mature, concealed by closely appressed sheaths, monophyllous. Sheaths four to seven, brownish when dry, conspicuously nerved, with the nerves prominent and more or less hispidulous, dilated at the tip into a round-ovate marginate hispid lamina which is 3 mm. long on the uppermost sheaths. Leaf 2-3 cm. long, up to 1.4 cm. wide, elliptic or elliptic-oblong, weakly marginate, narrowed into a short sulcate rigid petiole, glabrous. Peduncles several, concealed at the base by an elongated slenderly infundibuliform brownish sheath which is more or less hispid on the nerves, fasciculate, shorter than the leaf, flowering in succession, bearing as many as six dark red and greenish flowers in a slender raceme. Floral bracts hyalescent, glabrous, enclosing the pedicels. Raceme up to 12 mm. long, the terminal flower sometimes reaching to the middle of the leaf. Rachis smooth. Ovary scarcely 1 mm. long, glabrous. Lateral sepals smooth on the outer surface, 3.5 mm. long, united to about the middle, narrowly triangular, obtuse, forming with the foot of the column a distinct mentum which is 1 mm. long, margins finely glandular-ciliate, the free portion of each sepal distinctly 3-nerved. Dorsal sepal 4 mm. long, 1 mm. wide, oblong-lanceolate, obtuse, strongly concave at the base, 3-nerved, margin inconspicuously glandular-ciliolate above the middle. Petals 2 mm. long, scarcely 1 mm. wide, oblong to oblong-lanceolate, narrowed to a very acute tip, irregularly fimbriate on the margin above the middle, 1-nerved. Labellum 2.5 mm. long, about 1 mm. wide, narrowly oblong, obtuse, 3-nerved, with the margin glandular-ciliolate, at the base shortly clawed with an auricle on each side of the claw and a thickening in front of it. Column about 2 mm. long, produced into a conspicuous foot, dilated upward to the finely denticulate or fimbriate apex.

Closely allied to *Pleurothallis peraltensis* Ames, which is distinct in its subpandurate labellum with more conspicuous

PLEUROTHALLIS *Fig. 7*
Standleyi Ames



and longer fringe on the margin. It is also closely allied to *P. brevis* Schltr., another Costa Rican species of the *Lepantheformes* section of the genus, but appears to differ from it in the flowers being entirely glabrous on the outer surface, in the column being conspicuously lacerate on the margin of the clinandrium, and in the ovary being glabrous and not at all hispidulous in any of the flowers examined. [Fig. 7: 1, column flattened out to show apical lobes $\times 10$. 2, labellum $\times 13$. 3, petal $\times 10 \frac{1}{2}$. 4, dorsal sepal, petals and column $\times 6 \frac{1}{2}$. 5, lateral sepals $\times 7$. 6, raceme $\times$ about 4.]

COSTA RICA, Province of Cartago, El Muñeco, south of Navarro, *Paul C. Standley 33607* (TYPE in Herb. Ames No. 29143.), 33796, February 8, 9, 1924. About 1400 meters altitude. Flowers dark red and greenish.

***Pleurothallis strumosa* Ames sp. nov.** Herba dense caespitosa, pusilla. Caules secundarii abbreviati, monophylli. Folium in petiolum brevem contractum, ellipticum vel elliptico-lanceolatum, apice minute tridenticulato. Pedunculus folium superans, gracilis, apice bracteoso. Flores succedanei, fasciculati. Sepala lateralia valde caudata, oblongo-lanceolata, binervia, extus nervis glandulosis, in margine conspicue glandulosa. Sepalum dorsale simile, trinervium. Petala lanceolata, uninervia, in margine sparse fimbriata. Labellum breviter unguiculatum, trinervium, antice linguiforme, prope basim utrinque obscure auriculatum, margine inconspicue glanduloso, prope basim late bicarinatum, carinis triangularibus. Columna gracilis, apice cucullato, basi in pedem bilobum glandulosum strumosum producta.

Roots whitish, fibrous, smooth. Rhizome abbreviated. Secondary stems densely caespitose, about 6 mm. long, slender, partly concealed by an elongated tubular sheath, monophyllous. Leaf shortly petioled, 14 mm. long, 4–5 mm. wide, with the lamina very fleshy, elliptical or elliptic-lanceolate, lightly marginate, tridenticulate at the apex. Peduncle slender, elongated, much exceeding the leaves, up to 2.6 cm. long, with a closely appressed tubular bract near the middle

and at the summit terminated by several imbricating bracts. Flowers fasciculate, opening in succession, hyaline, spotted with maroon. Pedicel and ovary about 4 mm. long, much exceeding the subtending bract. Lateral sepals 6.5 mm. long, 1.5 mm. wide above the base, oblong-lanceolate, caudate, 2-nerved, the inner nerve forming a distinct external keel, conspicuously glandular along the nerves on the outer surface and on the margin, the marginal glands .25 mm. long. Dorsal sepal 7 mm. long, 1.5 mm. wide near the middle, similar to the lateral sepals, 3-nerved, the nerves carinate on the outer surface and distinctly glandulose. Petals about 3 mm. long, scarcely 1 mm. wide at the middle, narrowly lanceolate, acute, sparsely fimbriate, 1-nerved. Labellum 3 mm. long, about 1 mm. wide above the middle, 3-nerved; apical portion very fleshy, linguiform, strongly convex, shallowly excavated beneath, rounded at the apex; basal portion minutely auriculate on each side in front of the broad abbreviated claw, glandular beneath, raised on either side in a broad triangular keel. Column slender, about 2 mm. long, at base produced into a conspicuous blunt bilobulate glandulose foot, strongly cucullate at the apex, with the apical margin faintly denticulate.

From *Pleurothallis hastata* Ames, its nearest Central American ally, *P. strumosa* is in part separable by its conspicuously 3-nerved fringeless labellum and by its conspicuously glandular sepals. [Fig. 6: 5, flower with perianth segments spread out $\times 5$. 6, labellum $\times 8 \frac{2}{3}$.]

COSTA RICA, Carpintera, C. H. Lankester 766, February 1924. (TYPE in Herb. Ames No. 28813.)

***Pleurothallis uncinata* Fawc.** in Journ. Bot. 33 (1895) 12; *Cogn.* in Urb. Symb. Antill. 6 (1909) 416; *Fawc. & Rendle* Fl. Jam. 1 (1910) 63, t. 10.

Pleurothallis uncinata Fawc. has not been noted heretofore as a native of Central America.

COSTA RICA, Province of Cartago, El Muñeco, south of Navarro, *Paul C. Standley* 33900, 33904, 33911, February

8, 9, 1924. About 1400 meters altitude: Alto de La Estrella, *Standley 39564*, March 26, 27, 1924.

Pleurothallis velaticaulis *Reichb. f.* in *Linnaea* 22 (1849) 824.

Pleurothallis Pittieri *Schltr.* in *Fedde Repert.* 3 (1906) 247.

Recent collections made in Costa Rica have included numerous specimens of a very variable species which I believe is inseparable from the West Indian *Pleurothallis velaticaulis* *Reichb. f.* The range of variation includes *P. Pittieri* *Schltr.*, and I now regard this species, which should be reduced to synonymy, as a luxuriant floriferous form of *P. velaticaulis*.

COSTA RICA, Province of San José, La Palma, *Paul C. Standley 32899, 32929*, February 3, 1924. On tree. About 1600 meters altitude; *Standley 38299*, March 17, 1924; La Hondura, *Standley 36604*, March 2-4, 1924. 1300-1700 meters altitude: Las Nubes, *Standley 38894*, March 20-22, 1924. About 1500-1900 meters altitude.

Lepanthes horrida *Reichb. f.* *Beitr. Orch. Centr. Am.* (1866) 91.

Lepanthes rostrata *Ames* *Sched. Orch.* 5 (1923) 22.

Studies of a large collection of *Lepanthes horrida* *Reichb. f.* obtained in 1924 by Paul C. Standley indicate that *L. rostrata* *Ames* should be reduced to synonymy. In the original description of *L. rostrata* the characters which were relied on for separation from *L. horrida* were set forth in detail. These characters fail to hold when studied throughout an abundance of material.

COSTA RICA, Province of San José, between Las Nubes and San Isidro de Coronado, *Paul C. Standley 3881*, March 22, 1924. 1420-1800 meters altitude: Las Nubes, *Standley 38534, 38597, 38676, 38679, 38687, 38722, 38914, 38926, 39810*, March 20-22, 1924. About 1500-1900 meters altitude: La Palma, *Standley 33191, 33216*, February 3, 1924. About 1600 meters altitude.

***Lepanthes Standleyi* Ames sp. nov.** Herba caespitosa, nana. Caules secundarii vaginis muricatis obtecti, monophylli. Folium ellipticum, apice tridenticulatum, bene marginatum. Pedunculi folio breviores, distichiflori. Bractee inflorescentiae cymbiformes, muricatae vel bene glandulosae. Sepala lateralibus usque ad medium cohaerentia, diaphana, ovato-lanceolata, acuta. Sepalum dorsale simile, trinervium. Petala latiora quam longiora, transverse bilobata; lobo posteriore angustiore oblongo, subobtusio, sepalum dorsale vix aequanti; lobo anteriore simili. Labellum bilobatum, lobis aliformibus. Columna usque ad apicem dilatata.

A dwarf caespitose species 2.5–5 cm. tall. Roots fibrous, spreading, whitish. Secondary stems about 2.5 cm. long when mature, monophyllous, concealed by about four blackish or purplish sheaths. Sheaths 4–10 mm. long, gradually dilated upwards, slenderly infundibuliform, hispid along the nerves. Leaf 2–3 cm. long when nearing maturity, about 1 cm. wide, elliptic, contracted at base into a short petiole, tridenticulate at the apex, longer than the inflorescence, often purplish beneath, marginate. Peduncle with the raceme about 1.5 cm. long, bearing a bract near the middle. Raceme abbreviated, distichously flowered. Bracts of the raceme hispidulous, somewhat cymbiform, acute. Lateral sepals united to about the middle, 3 mm. long, 2 mm. wide, ovate-lanceolate, translucent, 2-nerved. Dorsal sepal similar, 3-nerved. Petals about 1 mm. long opposite the point of insertion at the base of the column, 5 mm. wide; posterior portion 2 mm. long, scarcely equaling the dorsal sepal, narrowly oblong, subobtusate, about .5 mm. wide; anterior portion similar, about 3 mm. long, extending beyond the middle of the lateral sepals, obtuse. Labellum scarcely 2 mm. long, deeply cleft, and forming two aliform or broadly falcate lobes with obtuse tips. Column 1 mm. long, gradually dilated upward.

Allied to *Lepanthes estrellensis* Ames, but very much smaller with different labellum.

COSTA RICA, Province of San José, Las Nubes, *Paul C. Standley* 38800, March 20–22, 1924. 1500–1900 meters alti-

tude. On tree; flowers red; leaves purple beneath. (TYPE in Herb. Ames No. 29633.); *Standley* 38787. Flowers purple-red.

***Lepanthes Turialvae* Reichb. f.** Beitr. Orch. Centr. Am. (1866) 57, t. 10, fig. III, 16; Reichb. f. Xen. Orch. 1 (1856) 151, 156, t. 50, figs. V, 15, 16.

Lepanthes Tonduziana Schltr. in Fedde Repert. Beihfte 19 (1923) 180.

An examination of numerous specimens that are chiefly referable to *Lepanthes Turialvae* indicates that this species includes *L. Tonduziana* Schltr.

COSTA RICA, Province of San José, La Hondura, *Paul C. Standley* 36374, 38499, March 2-4, 1924. 1300-1700 meters altitude: Province of Cartago, La Estrella, *Standley* 39410, March 26, 27, 1924: Province of Cartago, Vicinity of Orosi, *Standley* 39816, March 30, 1924: Volcán de Poás, along the road between La Lechería and the Hotel, *Standley* 34625, February 17, 1924. 2100-2600 meters altitude: Upper slopes of Volcán de Poás, between the Hotel and the crater, *Standley* 34645, 34918, February 17, 1924. 2500-2640 meters altitude.

***Pachystele corallorrhiza* Ames sp. nov.** Herba epiphytica. Caulces vel pseudobulbi graciles, superpositi, bifoliati. Inflorescentia terminalis ad apicem pseudobulbi singula, spathis vel vaginis scariosis satis magnis usque ad basin capsulae protecta. Sepala lateralia triangularia, septemnervia. Sepalum dorsale simile, apice carinato. Petala ligulata, quinquenervia. Labellum panduratum, obtusum. Columna crassa, supra medium valde dilatata, bialata.

Epiphytic herb about 30 cm. tall, often branching. Roots about 2 mm. in diameter, covered with pustular emergences which give to them a coralline aspect. Stems slender, superposed, bifoliate, about 3 mm. thick, concealed at the base by elongated tubular sheaths which are 2-4 cm. long, joints conspicuously swollen. Leaves subopposite, 6-8 cm. long, up to 8 mm. wide, ligulate, coriaceous, unequally bilobed at the apex with the lobes obtuse. Inflorescence ter-

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minal, 1-flowered, much shorter than the leaves, with several closely imbricating sheaths which reach to the base of the ovary. Flower-stalk and ovary about 3 cm. long, slender, glabrous. Lateral sepals about 11 mm. long, 5 mm. wide below the middle, triangular, acute, 7-nerved. Dorsal sepal about 11 mm. long, carinate beneath the acute apex, triangular, 7-nerved. Petals about 11 mm. long, 2.5 mm. wide, narrowly oblong or ligulate, narrowed above the middle into a subacute tip, membranaceous, 5-nerved. Labellum 1 cm. long, 8 mm. wide above the middle, broadly pandurate, entire, obtuse, inserted on the broad foot of the column. Column about 5 mm. long, fleshy at the base, dilated above, conspicuously winged on each side above the middle.

Allied to *Pachystele densa* Schltr., but much larger in all its parts, with different sepals and petals, and with pustular roots.

COSTA RICA, Province of San José, Las Nubes, *Paul C. Standley* 38909, March 20–22, 1924. 1500–1900 meters altitude. On tree. (TYPE in Herb. Ames No. 29711.)

***Ponera striata* Lindl.** in Bot. Reg. 28 (1842) Misc. 18, 19.

Specimens referable to this species have been received from C. H. Lankester. My records do not show that *Ponera striata* has been heretofore reported from Costa Rica.

COSTA RICA, Peralta, *C. H. Lankester* 955. (Material in alcohol: No. 940.) Flowers hyaline, streaked with pink-purple. In cultivation at Las Concavas, November 9, 1924.

***Jacquiniella globosa* (Jacq.) Schltr.** in Fedde Repert. Beihefte 7 (1920) 124.

Epidendrum globosum Jacq. Enum. Pl. Carib. (1760) 29; Jacq. Sel. Stirp. Am. (1763) 222, t. 133, fig. 1.

This species has not been reported heretofore from Costa Rica. Although the Costa Rican specimens examined are in bud, they are clearly referable to *Jacquiniella globosa* (Jacq.) Schltr.

COSTA RICA, Province of Cartago, Dulce Nombre, *Paul C. Standley* 35805, February 27, 1924. On tree. 1400 meters altitude.

Hexisea Lankesteri *Ames sp. nov.* Herba epiphytica, foliis subteretibus instructa. Caules graciles, paucivaginati, vaginis demum in fibras solutis. Sepala triangulari-ovata vel oblongo-lanceolata, acuta. Petala oblonga, nonnihil subpandurata. Labellum membranaceum, saccum ovario adnatum formans, prope basim valde deflexum, superne in laminam subovatam expansum, apice valde retuso. Discus infra medium callosus. Columna gracilis.

Roots fibrous, whitish, smooth, spreading. Stems slender at the point of origin, about 1.5 dm. long, gradually but slightly thickened upward, subdichotomously branched above, jointed, when young concealed by closely appressed imbricating scarious sheaths, when mature barely concealed by the spreading fibrous remains of the withered sheaths. Leaves 6–11.5 cm. long, about 3 mm. in diameter near the base, semiterete, pointed, obliquely spreading, jointed. Inflorescence arising from the axil of a terminal leaf. Flowers white, borne singly, inconspicuous, subtended by scarious imbricating sheaths. Pedicel with the ovary about 5 mm. long. Lateral sepals 6.5–7 mm. long, about 3 mm. wide, oblong-triangular, acute, thickened at the tip, adherent to the lip at base and with it forming a conspicuous sac which is 3 mm. long and adnate to the ovary. Dorsal sepal 6 mm. long, about equal to the laterals, oblong-lanceolate, conspicuously thickened and fleshy at the acute tip. Petals 5–6 mm. long, narrower than the sepals, oblong, lightly pandurate, variable in width, subacute, membranaceous, exceeding the column. Labellum adnate to the column at base, with a conspicuously bent claw; free portion about 5 mm. long, 4.5 mm. wide in front of the claw, broadly ovate, retuse, with an obscurely erose margin, fleshy-thickened on the disc,—the thickening extending forward on the disc, somewhat interrupted in front so that it appears to be made up of crescentiform calli, one on each side. Sac (formed by the labellum and lateral sepals)

3 mm. long, rounded in front, almost completely adherent to the ovary. Column slender, free portion 4 mm. long, simple above the base.

Hexisea Lankesteri is a member of the group for which Dr. Rudolf Schlechter has proposed a new generic concept under the name *Fractiunguis*. It is closely allied to *Hexisea cuniculata* (Schltr.) Ames comb. nov. (*Fractiunguis cuniculatus* Schltr. in Fedde Repert. Beihefte 19 (1923) 31), but differs in the more robust habit, in the size of the flowers, and in the outline and calli of the labellum.

COSTA RICA, Pacaya, C. H. Lankester 519, September 6, 1923. Flowers white, marked with purple near the base of the lip. (TYPE in Herb. Ames No. 27259.)

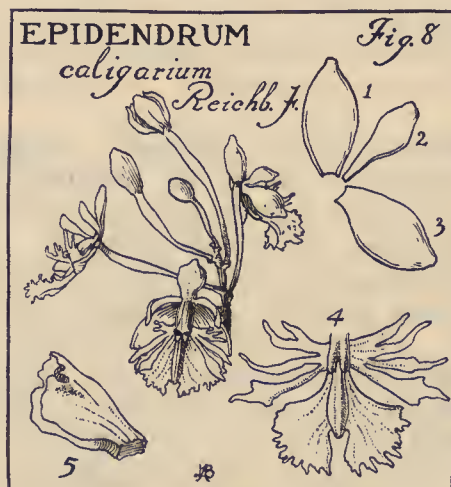
Epidendrum caligarium Reichb. f. in Gard. Chron. (1869) 1110.

Roots very fleshy, whitish. Stems 30 cm. or more long, 3-5 mm. thick, the closely appressed sheaths of the leaf whitish when dry, thickly studded with blackish verruciform emergences. Leaves distichous (the upper ones), 1.5-6 cm. long, about 5 mm. wide, the lower ones early deciduous and wanting during anthesis (not seen). Flowers membranaceous, crowded in a terminal compound or bifurcate raceme, pale rose-purple (pink). Sepals 5-6 mm. long. Petals 5 mm. long, much narrower than the sepals. Labellum 8 mm. long, with the lateral lobes quadripartite and the terminal lobe deeply retuse. Column about 4 mm. long, adnate to the labellum, dilated upward, 4-lobed at the summit, deeply stained with purple-rose. Crest of the labellum yellowish, bilobed, the lobes fleshy, ascending, blunt. Ovary cuniculate.

Epidendrum caligarium was originally reported as a native of New Grenada by Wentworth W. Buller, who sent specimens to the Royal Gardens, Kew, with the following note: "This *Epidendrum* has quite the habit of *myrianthum*. The general appearance of the flower also resembles that species, but the side lobes of being so much divided seem to make it a separate species. It came from New Grenada."

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When Reichenbach published the original description in *Gardeners' Chronicle*, he referred to *E. caligarium* as a native of Central America. In 1918, Rudolf Schlechter ascribed the species to Mexico. Specimens recently submitted for identification by C. W. Powell localize *E. caligarium* definitely as a native of Panama and make possible an amplification of the original and incomplete Reichenbachian characterization. As far as I am able to ascertain, Powell's speci-



mens represent the second collection of this rare plant and clarify what has been, since 1869, an obscure and doubtful species.

In Mr. Powell's specimens the closely appressed tubular sheaths of the leaves are whitish and densely covered with black emergences which suggest some fungus disease.

If *E. caligarium* proves to be tractable under cultivation, it would be a welcome addition to what may be termed the "semi-botanical" section of our orchid collections. A clump of it in full flower must be a delightful sight. [Fig. 8: 1, dorsal sepal $\times 3$. 2, petal $\times 2 \frac{3}{4}$. 3, lateral sepal $\times 3$. 4, labellum $\times$ about $2 \frac{1}{4}$. 5, column $\times 4 \frac{1}{4}$.]

PANAMA, Province of Veraguas, San Juan, C. W. Powell 380, February 1924. 1200 feet altitude.

Epidendrum fundi Ames sp. nov. Herba epiphytica ramosa. Caules vaginis foliorum valde rugulosi. Folia lineari-oblonga, obtusa. Flos singulus. Sepala lateralalia lanceolata, apice cymbiformi, conspicue trinervia. Sepalum dorsale oblongum, usque ad apicem attenuatum, valde trinervium. Petala linearia, usque ad apicem angustata, trinervia. Labellum basi columnae adhaerens; pars labelli libera ovato-cordata, acuminata, acuta. Discus labelli valde nervosus, nervo medio prominenti. Columna carnosa, truncata.

Roots slender, fibrous, glabrous. Stems branching, foliose, whole plant 19–20 cm. tall. Sheathing bases of the leaves 8–11 mm. long, strongly complanate, when dry conspicuously rugulose, transversely wrinkled. Leaves 2–2.5 cm. long, 2–3 mm. wide, linear-oblong, tapering gradually toward both ends, 1–1.5 cm. apart, obtuse, mid-nerve prominent beneath. Peduncle slender, sheathed by a scarious strongly complanate conduplicate bract. Flowers solitary. Lateral sepals 6.5 mm. long, lanceolate, cymbiform at the tip, prominently 3-nerved with a supplementary nerve usually present. Dorsal sepal 8 mm. long, scarcely 2 mm. wide near the base, tapering gradually to the thickened apex, prominently 3-nerved. Petals 7 mm. long, about 1 mm. wide, linear, tapering gradually to the obtuse tip, prominently 3-nerved with the nerves approximate. Labellum adnate to the column, 6 mm. long (including the adherent base); free portion 5 mm. long, about 2.5 mm. wide, ovate-lanceolate from a cordate base, strongly concave in front of the column. Disc nervose, the nerves prominent, with the middle one forming a distinct keel on the upper surface. Column stout, scarcely 2.5 mm. long, entirely adnate to the labellum.

Near allies of this species are *Epidendrum rugosum* Ames and *E. Sanchoi* Ames, which are in part clearly distinct in having pustulose emergences on the leaf-sheaths and several-flowered racemes. *Epidendrum singuliflorum* Schltr., another

member of the alliance, is a Guatemalan species clearly distinguished from *E. fundi* by its very dissimilar labellum, broader leaves, and larger flowers.

COSTA RICA, Southern slope of Volcán de Turrialba, near the Finca del Volcán de Turrialba, *Paul C. Standley* 35080, February 22, 1924. About 2000–2400 meters altitude. On tree. (TYPE in Herb. Ames No. 29147.); *Standley* 35119, from the same locality, is undoubtedly the same species.

Epidendrum glandulosum Ames Sched. Orch. 7 (1924) 5, t. 20.

This species, which was discovered by C. W. Powell in Panama in 1923 on a trail near Colon, has recently been received from C. H. Lankester, who collected specimens in Costa Rica. The extension of range is remarkable, as the orchids of the Canal Zone rarely occur in Costa Rica unless they are representatives of common species which have the capacity to adjust themselves to varied conditions and are of wide distribution.

The leaves of this species are semi-terete in specimens preserved in alcohol. While the type was characterized by a few-flowered raceme, additional material received from Mr. Powell exhibits plants which have six or more flowers in loose racemes.

COSTA RICA, San Carlos, *C. H. Lankester* 937, April 1923.

Epidendrum miserrimum Reichb. f. in Bonpl. 3 (1855) 220.

Epidendrum poaeforme Schltr. in Fedde Repert. Beihefte 19 (1923) 43.

Schlechter, in the notes accompanying the original description of *Epidendrum poaeforme*, compares this species with the West Indian *E. miserrimum* Reichb. f. The differences between Costa Rican specimens referable to *E. poaeforme*

and typical plants of *E. miserrimum* are so subtle that specific distinction is questionable, and it seems best to relegate *E. poaeforme* to synonymy.

COSTA RICA, C. Werckle.

HAITI, GUADELOUPE, DOMINICA, GRENADA.

***Epidendrum Standleyi* Ames sp. nov.** Herba epiphytica. Caules erecti, approximati, paucifoliati. Folia semiteretia, acuta. Flos terminalis. Sepala lateralalia anguste oblongo-lanceolata, apice incrassato. Sepalum dorsale simile. Petala anguste lanceolata, apice plus minusve triquetro. Labellum semiliberum, trilobatum; lobis lateralibus erectis; lobo medio supra medium tereti, valde incrassato. Discus trinervius. Columna infra apicem labello adnata.

Epiphytic herb allied to *Epidendrum teretifolium* Sw. and to *E. cobanense* Ames & Schltr. Roots branching, whitish, glabrous. Stems approximate on a creeping rhizome, erect, cylindrical, slender, 8–20 cm. tall, about 2 mm. in diameter when dry, partly concealed by the cinnamon-brown rather closely appressed rugulose sheaths of the leaves. Leaf-sheaths tubular, up to 2.2 cm. long, 3.5–4 mm. in diameter at the truncate summit. Leaves about four, obliquely ascending, 3.5–5.5 cm. long, semiterete, 2.5 mm. in diameter in the dried specimens, acute. Inflorescence arising from the axil of the uppermost leaf, subtended by a scarious sheath which arises opposite the leaf-axil. Pedicel, ovary, and tubular base of the flower about 1.7 cm. long. Flowers purplish-bronze, solitary. Lateral sepals forming with the base of the labellum a tubular sac which is adnate to the lower portion of the elongated column; free portion of each sepal 1.1 cm. long, about 2 mm. wide, narrowly oblong-lanceolate, acute, 5-nerved, complanate-thickened near the apex. Dorsal sepal similar, about 3 mm. wide near the middle, and at the apex simply thickened, subacute. Petals 1 cm. long, 2 mm. wide, narrowly lanceolate, somewhat triquetrous at the tip, subacute, fleshy, 3-nerved. Labellum adnate to the column 4 mm. from the summit; free portion 9 mm. long, distinctly 3-lobed, fleshy, more or less condu-

plicate; lateral lobes erect, near the middle of the lamina, coarsely bidentate or tridentate on the margin or entire; middle lobe fleshy, acute, about 5 mm. long, very narrow, tapering gradually to the fleshy terete tip. Disc conspicuously 3-nerved, the nerves becoming verrucose where they terminate. Column about 6 mm. long, entire at the summit. Pollinia strongly flattened.

A close ally of *Epidendrum teretifolium* Sw., from which it differs in habit and in the form of the labellum. From *E. cobanense* Ames & Schltr. it differs conspicuously in having more membranaceous, pliable flowers and a very dissimilar labellum.

COSTA RICA, Province of Cartago, Vicinity of Orosi, *Paul C. Standley 39684*, March 30, 1924. On tree; flowers purplish bronze. (TYPE in Herb. Ames No. 29149.); *Standley 39698*, March 30, 1924. Flowers purplish green: Province of Cartago, El Muñeco, south of Navarro, *Standley 33779*, February 8, 9, 1924. About 1400 meters altitude. On tree. Flower faded. Leaves fleshy, semiterete.

***Dendrobium bunuanense* Ames nom. nov.**

Dendrobium appendiculoides. Ames Orch. 7 (1923) 93, non J. J. Sm.

Owing to an unfortunate oversight, the prior use of the name *Dendrobium appendiculoides* for a species from New Guinea, published by J. J. Smith in Feddc Repert. 12 (1913) 114, was not noted when the Philippine species to which I gave the name was published. The new name, *D. bunuanense*, has reference to Mt. Bunuan in Mindanao.

***Telipogon Standleyi* Ames sp. nov.** Herba epiphytica, parvula, foliis basalibus. Folia coriacea, anguste lanceolata. Racemus laxis, pauciflorus. Flores parvi. Sepala triangularia, uninervia. Petala anguste ovata, extus glabra, intus dense glandulosa, margine ciliato-glanduloso. Labellum oblongum, subacutum, dense glandulosum, trinervium. Columna brevis, dense glandulosa, breviter barbata.

NEW OR NOTEWORTHY ORCHIDS

Plant 3-6 cm. tall with several relatively large basal leaves, 5-10 mm. apart on the ascending complanate winged stems. Roots very coarse, whitish, smooth, spreading, somewhat flattened. Basal leaves crowded, sub-rosulate, 5-10 mm. long, up to 2 mm. wide, narrowly lanceolate, acute, fleshy, more or less erect; scale-like leaves 1-3 mm. long, alternate. Raceme up to 2.5 cm. long, loosely-flowered, with the rachis



strongly flattened and conspicuously winged. Floral bracts scale-like, more or less triangular, about 1 mm. long. Flowers yellow, about six, opening in succession, buds and fruits simultaneously present. Pedicellate ovary about 3.5 mm. long. Lateral sepals about 2.5 mm. long, strongly concave, triangular-ovate, acute, 1-nerved. Dorsal sepal similar. Petals 2.5 mm. long, 1.5 mm. wide below the middle, narrowly ovate, acute, glabrous on the outer surface, densely

glandulose within below the middle, margin conspicuously glandular-ciliate with the glands retrorse. Labellum 3 mm. long, 1 mm. wide, oblong, gradually narrowed to the sub-acute apex, 3-nerved, glandulose on the upper surface, with the margins closely ciliate-glandulose, the glands more or less retrorse. Column densely glandular, the dorsal and lateral glandular hairs being much reduced.

Telipogon Standleyi is closely related to *T. Lankesteri* Ames, from which it differs most strikingly in having the glandular hairs of the column much abbreviated and in being a dwarf plant with foliage present at flowering time.

The collector described the flowers as yellow. In dried specimens the flowers are yellow with a purplish or crimson tinged center, the lower half of the petals and labellum being more deeply colored than the upper half; the column is deep purple.

The petals appear to be 1-nerved, but on close scrutiny two supplementary nerves may be detected. [Fig. 9: 1, labellum spread out $\times 8$. 2, flower with the perianth segments spread out $\times$ about $5 \frac{3}{4}$. 3, column, from above, anther and pollinia removed, much enlarged. 4, pollinia, much enlarged.]

COSTA RICA, Province of San José, between Aserri and Tarbaca, *Paul C. Standley* 34120, February 12, 1924. On tree, flowers yellow. 1600-1900 meters altitude. (TYPE in Herb. Ames No. 29710.)

Cryptocentrum Standleyi Ames sp. nov. Herba epiphytica, pusilla, plus minusve erecta. Folia aggregata, erecto-patentia, linearia, carnosula, rigida, satis triquetra, valde acuta. Inflorescentia lateralis, uniflora. Pedunculus gracilis, ascendens, paucibracteatus, foliis vix longior. Sepala lateralia oblonga, utrinque attenuata, calcar dependens formantia. Sepalum dorsale oblongum, concaviusculum. Petala lanceolata, trinervia. Labellum concavum, lanceolatum, basi in unguem perlongum calcari sepalorum adnatum angustatum. Columna brevis, apice biauriculato. Pollinia quattuor.

NEW OR NOTEWORTHY ORCHIDS

Rhizome erect or ascending, about 3.5 cm. long, forming a pseudomonopodium from which the linear triquetrous leaves spread obliquely on all sides. Leaves jointed, deciduous at the joint, becoming tufted near and at the tip of the growing point of the rhizome, up to 1.9 cm. long including the slender persistent base which is about 6 mm. long and at the point of origin expanded into a clasping sheath. Leaf-blade 9–13 mm. long, scarcely .75 mm. wide in dried specimens, linear, curved, very acute, fleshy, more or less triquetrous. Inflorescence lateral, 1-flowered. Peduncle very slender, ascending, about 1.8 cm. long, at least 3-bracteate. Bracts up to 6 mm. long, tubular, more or less translucent, the uppermost one subtending the pedicel of the solitary flower and enclosing the blunt tip of the elongated sepaline spur which is about equal to the ovary and pedicel. Ovary and pedicel 13 mm. long. Flowers dull red, about 8 mm. long not including the slender spur which is 10 mm. long. Lateral sepals 8 mm. long, 1.5 mm. wide, oblong, shortly cuspidate at the tip, united below, free above, contracted into a slender elongated pendent cylindrical spur, 3-nerved. Dorsal sepal oblong, 8 mm. long, about 1.5 mm. wide, concave, tapering toward the base and the navicular acute tip. Petals narrowly lanceolate, 7 mm. long, about 2 mm. wide below the middle, acute, 3-nerved. Labellum 6 mm. long from base of column to tip, prolonged at base into a slender spur which is entirely enclosed in the spur formed by the lateral sepals; free portion strongly concave, lanceolate, acute. Column 2.25–2.5 mm. long, expanded above into two rounded wings. Pollinia four, strongly complanate.

Similar to the Colombian *Cryptocentrum Hoppii* Schltr., but separable from it by the color of the larger flowers and much larger sepaline spur. The nearest Central American ally is undoubtedly *C. gracillimum* Ames & Schweinf., which is a much larger plant.

COSTA RICA, Province of San José, La Palma, *Paul C. Standley* 33028, February 3, 1924. On mossy tree trunk; flowers dull red. About 1600 meters altitude. (TYPE in Herb. Ames No. 29632.)

Trichocentrum panamense Rolfe in Kew Bull. (1913) 341; Rolfe in Orch. Rev. 22 (1914) 270.

The type specimen of *Trichocentrum panamense* is characterized in my notes as "too scrappy to be useful." It is, therefore, a great satisfaction to have received from C. W. Powell both pressed and alcoholic material which surely represents Rolfe's species and makes possible a comparison between it and its nearest allies. In the original description, Rolfe emphasized the four-lobed tip of the spur of the labellum. It is this peculiarity which serves best to differentiate *T. panamense* from *T. capistratum* Linden & Reichb. f., a native of Costa Rica, which is in part characterized by a five-lobed spur. In Reichenbach's herbarium, there is a drawing of a species that he identified as being *T. capistratum* (a Liebmann plant) which has a four-lobed spur and in general aspect resembles very closely the Powell specimens which I take to be representative of *T. panamense*. It would seem that the number of lobes of the spur is variable, or that the identification of the Liebmann specimen was carelessly attempted, and that it is in reality conspecific with *T. panamense* Rolfe. As it is impossible to settle definitely at this time the status of *T. capistratum*, it seems best to accept *T. panamense* as a valid species, the four-lobed spur being the salient differentiating character.

PANAMA, On bush-covered hills east of the Panama Canal. (TYPE in Herb. Kew.): Trail from Fort Sherman to mouth of Chagres River, C. W. Powell 371. Sea level.

Dichaea Standleyi Ames sp. nov. Caules fasciculati, plus minusve flexuosi, compressi, distanter foliati. Folia decidua, graminea, linearia, acuta, disticha, papyracea. Flores singuli e foliorum axillis orientes. Pedunculi folio breviores. Sepala lateralia patentia, lanceolata, acuta, quinquenervia. Sepalum dorsale simile. Petala patentia, lanceolata, quinquenervia, in apice acuto triquetra. Labellum supra basim cuneatam in laminam crescentiformem expansum, minute glandulosum, septemnervium. Columna valde incrassata.

NEW OR NOTEWORTHY ORCHIDS

An epiphytic herb up to 15 cm. tall. Roots whitish, spreading, fibrous. Stems concealed by the sheathing bases of the elongated leaves, complanate. Leaves up to 3.5 cm. long, 2-3 mm. wide, gramineous, distichous, linear-oblong, acute, more or less hispidulous on the margin above the middle, jointed with the complanate sheathing base. Leaf-sheaths 7-10 mm. long. Peduncles arising from the stem near the axils of the leaves, lateral, concealed at base by the leaf-sheaths, 7-10 mm. long, 1-flowered. Floral bract 4-5 mm. long, scarious, round-ovate, acute, thickened at the tip. Lateral sepals spreading, 7.5 mm. long, 3 mm. wide, lanceolate, acute, 5-nerved. Dorsal sepal similar and equal to the laterals. Petals lanceolate, acute, 6 mm. long, 2 mm. wide, 5-nerved, thickened and subtriquetrous at the acute tip. Labellum 5 mm. long, 7 mm. wide; basal half cuneate-oblong, 2 mm. wide; apical half crescentiform, apiculate, with the horns of the crescent 2 mm. long, narrowly triangular, retrorse and acute, minutely glandular. Disc 7-nerved. Column stout, 3 mm. long.

From *Dichaea Lankesteri* Ames, this species differs in floral proportions and in the tip of the labellum being apiculate rather than thickened into a more or less triquetrous prolongation. In habit *D. Standleyi* resembles *D. graminoides* (Sw.) Lindl., but is readily distinguished from that species by the outline of the labellum.

COSTA RICA, Province of Limón, Vicinity of Guápiles, *Paul C. Standley 37440*, March 12, 13, 1924. 300-500 meters altitude. On tree; flowers white and purple-red. (TYPE in Herb. Ames No. 29640.)

Orchidotypus muscoides Kränzl. in Engl. Bot. Jahrb. 37 (1906) 383; Kränzl. in Engl. Pflanzenreich IV. 50 (Heft 83) (1923) 59, fig. 3. C. a-e.

This species has appeared in a large collection of orchids found by Paul C. Standley in Costa Rica. Although there are slight differences in the measurements of the floral parts between the Costa Rican plants and the Peruvian type, these differences do not warrant specific separation. Or-

NEW OR NOTEWORTHY ORCHIDS

chidotypus is an addition to the orchid genera of Central America.

COSTA RICA, Southern slope of the Volcán de Turrialba, near the Finca del Volcán de Turrialba, *Paul C. Standley* 35099, February 20, 1924. Epiphyte. Flowers pale green. 2000-2400 meters altitude.

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